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production of generic drugs, but [redacted] as much as Waxman's legislation. The main potential problem with the proposal is that it attempts to extend the patent life of drugs by an administrative ruling rather than through legislative change in patent law. The plan would guarantee that drugs could not be duplicated generically for up to 15 years after FDA approval. At a hearing in August, Waxman challenged FDA's authority to carry out the proposal and the measure would almost certainly be challenged in court if approved by Heckler.

Although it appears that all the parties involved are at loggerheads, there may be room for compromise. Some opponents of patent extension, such as Public Citizen Litigation Group, have suggested a modest form of patent extension that even PMA says would be better than nothing. PMA's best hope is that the period of patent extension would be measured from the date when a company applies to FDA to begin clinical trials to the date when the drug is approved. Public Citizen has proposed that the clock start running when a company applies to FDA for permission to begin marketing the drug. The consumer group argues that this is actually the period when a drug undergoes federal review. This period would add perhaps 2 years, far fewer than the time allotted by the draft legislation. A House aide involved in the issue said that the shorter way of measuring the patent extension "is a major improvement" over the current legislation. Nevertheless, according to this aide and others, Gore and Waxman still believe that the drug industry has yet to prove its case.—MARJORIE SUN

World Model for the Joint Chiefs

The Joint Chiefs of Staff (JCS) are getting a new toy that should make other government agencies green with envy: a computerized global model of political, resource, and social data that represents a step toward catching up with private sector capacities.

The system, called FORECASTS, is in its second year of development, at a cost of $1.2 million. It will be tested for 6 months by the Army Corps of Engineers before the Joint Chiefs get it next year. The primary reason for the acquisition is to help the JCS make their 4-year Joint Long Range Strategic Appraisal, a new exercise, started in 1980, to evaluate global and national trends up to 30 years hence. The services, which do their own appraisals, will also be using the model.

For several years the JCS has had the use of the World Integrated Model (WIM), FORECASTS' predecessor. But the new one goes far beyond WIM, according to Patricia G. Strauch, president of Prospective Decision Models, Inc., the contractor. WIM, which is in use in several other government agencies, has a much smaller data base, it divides the world by multination regions, and contains little information on such critical areas as the environment.

Unlike WIM, which is designed for long-range projections, FORECASTS has three modes of operation: a data base covering the years 1960 to 1980, short-range statistical procedures for extrapolations up to 5 years, and a long-range program which contains complex feedback and interactive capacities for projections up to 30 years in the future.

While most global models divide the world into regions or sectors (such as agriculture), FORECASTS can present data on a national as well as a regional basis. The vastly expanded data base contains information on vital characteristics ranging from land use to international political agreements. There is a new "political stability" module capable of being decoupled if security demands it. The model contains extensive detail on population, including sex, fertility, employment, urban-rural distribution, and migration, as well as social, religious, and linguistic subdivisions.

In recognition of the discontinuities that mark the present and probable future, says Strauch, a fundamental premise of the model is that "the past won't repeat itself." In facilitating economic analysis, for example, designers of the model place reliance on detailed data about human-resource interactions rather than building in traditional and now-dubious assumptions about the causes and effects of inflation or unemployment.

Knowing the capacities of the new system does not answer questions about how it will be used. What sort of questions, for example, is it uniquely equipped to address? Colonel James Edgar of the JCS submits that it would be interesting to know if 20 years ago FORECASTS could have cued analysts in to the emergence of the Middle East as the world's energy fulcrum. It might also be asked whether the model will be used by the military to reinforce prior assumptions, or whether it will result in the introduction of a greater variety of nonmilitary, nonpolitical factors and a keener awareness of global interdependencies into defense analyses. Says Mihajlo Mesarovic of Case Western Reserve University, who developed WIM: "Using strategic planning models is absolutely essential in analysis of long-term policies, but in the hands of people without insight into future options it would be grossly misleading and dangerous to use—like a gun."

It would be interesting to speculate how this capability might alter the relation of the defense establishment to the Central Intelligence Agency and the State Department when it comes to assessing long-range political trends. State, in particular, is deeply attached to traditional ways and, says an official, tends to think of long-range planning as "anything over 6 months." Gerald O. Barney, who headed President Carter's Global 2000 effort, says the department has "very little expertise in the use of models" and little interest in them. Yet, he asserts, they are "ultimately going to have a big impact on the way foreign policy is formulated."

Comprehensive attempts at global modeling, starting with *Limits to Growth* in 1972, are often associated with "gloom and doom" visions of the world's future (*Science*, 22 July, p. 341). The White House, for example, has criticized calls for a centralized "foresight" capability as being motivated by an anti–free market, progovernment intervention ideology. Perhaps, then, the most significant contribution of FORECASTS will be to decouple global modeling from ideology and present it as a valuable tool in a world where some mistakes have become too costly to make.—CONSTANCE HOLDEN

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